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Mental Health of Postpartum Women During the COVID-19 Pandemic in Brazil

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Abstract

International studies have reported high levels of depression and anxiety symptoms in perinatal women due to the ongoing pandemic. The present study examined symptoms of depression and anxiety in postpartum women during the COVID-19 pandemic in Brazil. Participants were 625 women aged between 18 and 44 years (*M* = 31.6; *SD* = 5.3), with infants up to 6 months. The Generalized Anxiety Disorder Questionnaire (GAD-7) and the Edinburgh Postnatal Depression Scale (EPDS) were administered. Results showed clinically significant levels of depression (EPDS ≥13) in 47.4% of the participants, clinically significant levels of generalized anxiety (GAD-7 ≥10) in 41.8% of the cases, and comorbid symptoms in 33.1% of the participants. There was a significant positive correlation between symptoms of depression and anxiety. Furthermore, the infant's older age, the mother's younger age, and lower educational level were associated with potential clinical symptoms. Thus, prevention and intervention programs targeting perinatal mental health during the ongoing pandemic and beyond should be developed and prioritized.

Keywords: COVID-19 pandemic, mental health, anxiety, postpartum depression, postpartum women

SAÚDE MENTAL DE PUÉRPERAS DURANTE A PANDEMIA DE COVID-19 NO BRASIL

Resumo

Estudos internacionais têm reportado níveis elevados de sintomas de depressão e ansiedade em mulheres no período perinatal em resultado da atual pandemia. O presente estudo avaliou a sintomatologia de depressão e ansiedade em puérperas durante a pandemia de COVID-19 no Brasil. Participaram 625 mulheres, com idades entre 18 e 44 anos (M = 31.6; DP = 5.3), que tinham um bebê até 6 meses de idade. Foram administrados o Questionário de Transtorno de Ansiedade Generalizada (GAD-7) e a Escala de Depressão Pós-Natal de Edimburgo (EPDS). Os resultados mostraram níveis clinicamente significativos de depressão (EPDS ≥13) em 47.4% das participantes, níveis clinicamente significativos de ansiedade generalizada (GAD-7 ≥10) em 41.8% dos casos, e sintomas comórbidos em 33.1% da amostra. Registrou-se uma correlação positiva significativa entre os sintomas de depressão e ansiedade. Além disso, mais dias de vida do bebê, idade mais jovem da mãe e menor nível de escolaridade estavam associados a níveis potencialmente clínicos de sintomas. Assim, é prioritária a definição de programas de prevenção e intervenção na saúde mental perinatal durante o atual período pandêmico, com continuidade para o futuro.

Palavras-chave: pandemia COVID-19, saúde mental, ansiedade, depressão pós-parto, puérperas

SALUD MENTAL DE MUJERES POSPARTO DURANTE LA PANDEMIA DE COVID-19 EN BRASIL

Resumen

Estudios internacionales han reportado altos niveles de síntomas de depresión y de ansiedad en mujeres em el período perinatal como consecuencia de la actual pandemia. El presente estudio examinó los síntomas de depresión y ansiedad en mujeres posparto durante la pandemia de COVID-19 en Brasil. Las participantes fueron 625 mujeres, con edades entre 18 y 44 años (M = 31.6; SD = 5.3), que tenían un hijo de hasta 6 meses de edad. Se administró el Cuestionario de Trastorno de Ansiedad Generalizada (GAD-7) y la Escala de Depresión Postnatal de Edimburgo (EPDS). Los resultados mostraron niveles clínicamente significativos de depresión (EPDS ≥13) en el 47.4 % de las participantes, niveles clínicamente significativos de ansiedad generalizada (GAD-7 ≥10) en el 41.8 % de los casos y síntomas comórbidos en el 33.1 % de las participantes. Hubo una correlación positiva significativa entre los síntomas de depresión y ansiedad. Además, más días de vida del bebé, menor edad de la madre y menor nivel educativo se asociaron con niveles potencialmente clínicos de síntomas. Por lo tanto, se debe priorizar la definición de programas de prevención e intervención dirigidos a la salud mental perinatal durante la pandemia en curso, con continuidad para el futuro.

Palabras clave: pandemia de COVID-19, salud mental, ansiedade, tristeza posparto, mujeres pós-parto

On March 11, 2020, the World Health Organization (WHO) declared the infection caused by the new coronavirus (COVID-19) as a global pandemic, a fact that led government authorities in numerous countries to adopt measures of confinement and social distancing to contain the spread of the virus (Brooks et al., 2020). According to the World Health Organization (WHO), as of May 16, 2022, there were 521,920,560 confirmed cases and 6,274,323 deaths from COVID-19 in the world, with the Americas being the most affected regions (WHO, 2022). In Brazil, in the same period, more than 30 million cases and more than 665,000 deaths were confirmed (WHO, 2022), with the Southeastern region being the most affected, mainly the state of São Paulo, with more than 5.4 million cases and 168,712 deaths as of May 15, 2022 (Johns Hopkins University, 2022).

Catastrophic events, such as the current public health crisis and quarantine and social distancing measures, are associated with severe psychological effects, such as increased levels of stress, depression, and anxiety symptoms, fear, feelings of loneliness, confusion, and sleep disorders (Barros et al., 2020; Brooks et al., 2020; Serafini et al., 2020). The study by Barros et al. (2020) in Brazil, with more than 45 thousand adults, conducted during the pandemic, found high rates of sadness/depression (40.4%), anxiety/nervousness (52.6%), sleep disorders (43.5%), in addition to worsening pre-existing sleep disorders (48%), given that being younger, being a woman, and having a previous diagnosis of depression were risk factors for a more negative psychological impact.

A population group that is particularly vulnerable to the negative impacts on mental health caused by the pandemic, deserving special attention, is postpartum women. Extensive pre-pandemic studies have already characterized the puerperium as a period of significant vulnerability to the emergence of mental health disorders, with depression and anxiety being the most common conditions (Fawcett et al., 2019; Nakić Radoš et al., 2018; Shorey et al., 2018; Woody et al., 2017), which often co-occur (Farr et al., 2014). The meta-analysis by Shorey et al. (2018) found a 17% overall prevalence of postpartum depression (PPD) among healthy mothers with no previous history of depression. Along the same lines, in the systematic review and meta-analysis by Woody et al. (2017), the global prevalence of depression in the perinatal period was 11.9%, with women from low- and middle-income countries more affected than those from high-income countries. The estimated prevalence of suffering from at least one anxiety disorder during the perinatal period is 20.7%, affecting approximately 1 in 5 women (Fawcett et al., 2019). Farr et al. (2014) investigated the comorbidity of anxiety and depression symptoms in a sample of 4451 postpartum women. They observed that 6.3% of women simultaneously reported postpartum depression and anxiety symptoms.

In Brazil, according to a systematic review of 15 studies conducted before the pandemic, the prevalence of PPD symptoms in the first six months after childbirth ranged between 7.2% and 42.8%. This variability can be explained by differences between studies at the populational level studied, the instrument used, and the puerperium time in which the assessment is conducted (Lobato et al., 2011). For example, a study with women in the city of Vitória (in the

state of Espírito Santo, Brazil) who were in the period between 1 and 6 months after childbirth and who were treated in public health units found a prevalence of 39.4% of clinically significant depression symptoms, assessed with the Edinburgh Postpartum Depression Scale (EPDS ≥12) (Ruschi et al., 2007). Two other studies conducted in the state of São Paulo (Brazil), also using the EPDS (cutoff point ≥ 12), reported clinically significant depressive symptoms in approximately 28% (Fonseca et al., 2010) and 29.5% (de Campos & Rodrigues, 2015) of mothers in the period between 2 and 6 months after childbirth. Finally, data from the national survey entitled "Born in Brazil," conducted in 2011 and 2012, showed that 26.3% of mothers between 6 and 18 months after childbirth, that is, approximately 1 in 4 women, had clinical levels of postpartum depression symptoms (EPDS ≥13) (Theme Filha et al., 2016).

Regarding anxiety, a recent study conducted with 519 postpartum women (between 6-12 weeks postpartum) who attended a public health unit for monitoring high-risk cases (e.g., complications diagnosed during pregnancy or childbirth) noted that 19.8% of participants had clinically significant anxiety symptoms (Lamus et al., 2020), assessed using the Generalized Anxiety Disorder Questionnaire (GAD-7; Spitzer et al., 2006). Another study that assessed mothers of infants born in 2019 in the city of Rio Grande (in the state of Rio Grande do Sul, Brazil) found a 9.7% prevalence of significant anxiety symptoms (Loret de Mola et al., 2021). Thus, considering the adverse effects that perinatal mental health disorders have both for the mother and for the infant's subsequent development, such as, for example, damage to the mother-infant interaction and difficulties in the social and emotional functioning of infants (Slomian et al., 2019), it is essential to examine the impact of the current pandemic context on maternal mental health, to provide adequate and timely intervention to prevent issues in the future.

International studies conducted during the COVID-19 pandemic found a worsening of mental health indicators in the perinatal period. For example, in Italy, Zanardo et al. (2020) found that women in the immediate postpartum period during the COVID-19 quarantine had significantly higher depression symptoms than mothers who had their infants during the same period a year earlier. In another study of postpartum women in China, 33.5% of participants reported clinically significant depression symptoms (EPDS >12) during the pandemic (An et al., 2021). Along the same lines, Ceulemans et al. (2020) found potential clinical depression (EPDS ≥13) and generalized anxiety (GAD-7 ≥10) symptoms in 23.6% and 14%, respectively, of a sample of 3445 postpartum women during confinement in Belgium. Finally, a meta-analysis of studies on perinatal mental health during the COVID-19 pandemic showed an overall prevalence of depression of 22% in postpartum women (Yan et al., 2020). However, it was impossible to report the prevalence of anxiety symptoms due to limited evidence. Similarly, information on the comorbidity of depression and anxiety symptoms in postpartum women during the pandemic is also very limited. Although not reporting data separately, another meta-analysis conducted with pregnant and postpartum women indicates an overall prevalence of 18% of comorbid depression and anxiety symptoms during the COVID-19 pandemic based on evidence derived from three studies (Sun et al., 2020).

In general, the two meta-analyses mentioned above (Sun et al., 2020; Yan et al., 2020) allow us to identify two main gaps in the existing literature on the impact of the pandemic on perinatal mental health. On the one hand, most studies (so far) have assessed pregnant women compared to postpartum women, and none of the included studies were conducted in Brazil, despite being one of the most affected countries. In Brazil, a recent study by Loret de Mola et al. (2021) reassessed, at the beginning of the pandemic (May and July 2020), the depression and anxiety symptoms of mothers of infants born between January 1 and December 2019 (before the pandemic), in the state of Rio Grande do Sul. The authors reported clinically significant depressive symptoms in 29.5% of participants and clinically significant anxiety symptoms in 25.9% of cases. In addition, a substantial increase in symptoms was found compared to levels recorded in this same group of mothers before the COVID-19 pandemic, in which the prevalence of depression and anxiety symptoms was below 10%.

Despite the topic's relevance, Brazilian studies published on the mental health of postpartum women during the pandemic are still very scarce. Thus, this study aims to assess depression and anxiety symptoms experienced by puerperal women with infants up to 6 months old who went through their postpartum period during the COVID-19 pandemic in Brazil. Similar to what has been reported in the international literature and the study by Loret de Mola et al. (2021), with a sample of mothers from the state of Rio Grande do Sul at the beginning of the pandemic, we expect to find high levels of clinically significant depression and anxiety symptoms in the perinatal period as a result of the COVID-19 pandemic.

Method

Participants

The sample of the present study is composed of 625 women, aged between 18 and 44 (M = 31.6; SD = 5.3), with an infant up to 6 months old at the time of their participation. The participants come from the five regions of Brazil, mainly from the Southeastern region (n = 416, 67.9%), followed by the Southern region (n = 138, 22.5%), with the Northern region being the least represented (n = 10, 1.6%). Most participants reside in the state of São Paulo (n = 341, 55.6%), and five states did not have any participants in the study (Roraima, Tocantins, Alagoas, Maranhão, and Piauí). The sample is mainly composed of Caucasian participants (n = 474, 77.3%), married (n = 455, 74.3%), primiparous (n = 349, 55.8%), and with a college degree (n = 438, 71.5%). Table 1 presents detailed information on the characterization of the participants. The infants' ages ranged between 2 and 209 days (M = 102; SD = 52), corresponding to a mean age of approximately three months and ten days.

Table 1

Sociodemographic characterization of the sample

		n (%)
Brazilian region (*n* = 613)		
	Northern	10 (1.6)
	Northeastern	21 (3.4)
	Midwestern	28 (4.6)
	Southeastern	416 (67.9)
	Southern	138 (22.5)
Ethnicity (*n* = 613)		
	Caucasian	474 (77.3)
	Black	24 (3.9)
	Asian	9 (1.5)
	Brown	106 (17.3)
Marital status (*n* = 612)		
	Single	18 (2.9)
	In a relationship/engaged/living with a partner	134 (21.9)
	Married	455 (74.3)
	Separated or divorced	5 (0.8)
Educational level (*n* = 613)		
	Did not attend school	2 (0.3)
	Elementary School	11 (1.8)
	High school/certificate program	83 (13.5)
	Incomplete higher education	79 (12.9)
	Complete higher education	217 (35.4)
	Postgraduate degree	221 (36.1)
Primiparous (*n* = 625)		
	Yes	349 (55.8)

The inclusion criteria for the study were mothers ≥ 18 years old, living in Brazil, and having an infant ≤ 6 months old at the time of participation. Finally, participants who did not complete the questionnaires on mental health indicators were excluded from the statistical analysis. The sample size was calculated according to the number of newborns in the country in 2019. Thus, we estimated a minimum sample size of 300 participants based on an α level of 0.05 and heterogeneity equal to 50%.

Instruments

Sociodemographic and clinical questionnaire. The participants filled out a sociodemographic information questionnaire with questions about residence status, age, ethnicity, marital status,

and educational level, as well as information about the pregnancy (e.g., whether it was their first pregnancy and the infant's age).

Generalized Anxiety Disorder Questionnaire (GAD-7; Spitzer et al., 2006). The GAD-7 is a brief self-report questionnaire used to screen for generalized anxiety symptoms. It assesses how often the participant has been bothered by issues such as "Feeling nervous, anxious, or very tense" or "Having difficulty relaxing" in the past two weeks. The questionnaire consists of seven items, in which the answer varies between 0 and 3 points (0 = "Not once"; 1 = "Several days"; 2 = "More than half the days"; 3 = "Almost every day") (Spitzer et al., 2006). The total score can vary between 0 and 21 points, with a higher score indicating greater severity of generalized anxiety symptoms. Similar to other studies conducted during the current pandemic (e.g., Ceulemans et al., 2020), the cutoff point ≥ 10 was used to identify cases with potentially clinical levels (moderate to severe) of generalized anxiety (Spitzer et al., 2006). This questionnaire has good psychometric properties and reliability (α = 0.92) in the Brazilian population (Moreno et al., 2016).

Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987; validated for the Brazilian population by Santos et al., 2007). This scale aims to track postpartum depression symptoms through self-report. The questionnaire consists of 10 items that refer to the presence and intensity of depression symptoms in the last seven days. Each item is rated from 0 to 3 points, with the total scale score ranging from 0 to 30. A cutoff point ≥13 is often used to identify potential clinical levels of symptoms and, therefore, the increased risk of postpartum depression (Cox et al., 1987). Similar to other studies during the pandemic using the same instrument (e.g., Ceulemans et al., 2020), an EPDS cutoff point ≥13 was also used. In the validation study for the Brazilian population (Santos et al., 2007), a cutoff point ≥ 13 demonstrated a positive predictive value of 60% for the diagnosis of postpartum depression, with a sensitivity of 59.5% and a specificity of 88.4%.

Procedures

This study is part of a broader research project, which was conducted online, on the mental health and perinatal experiences of pregnant and postpartum women during the COVID-19 pandemic, which was approved by the Research Ethics Committee of *Universidade Presbiteriana Mackenzie* (UPM) [Mackenzie Presbyterian University] (CAAE no. 31155120.7.0000.0084). The survey was disseminated through the network of personal contacts, and social media (WhatsApp, Facebook, Instagram) on pages and groups focused on pregnancy, motherhood, and postpartum. The completion of the questionnaires of the survey project was conducted exclusively online between July 1 (2020) and February 15 (2021), lasting approximately 45 minutes. When the research website was accessed, an Informed Consent Form was immediately presented with the study objectives and the ethical aspects of the research. Then, the participants had to choose one of two options – to participate or not in the study – and, in case of acceptance, the participant could access and fill in the questionnaires.

Data analysis

Data were analyzed using the IBM SPSS Statistics 20.0 software (IBM Corp., 2011). For sample characterization purposes, frequencies and percentages were calculated for categorical variables and measures of central tendency (mean) and variability (minimum, maximum, and standard deviation) for interval variables. Subsequently, the frequency and percentage of women who scored above the cutoff point for depression (EPDS ≥13) and anxiety (GAD-7 ≥10) were calculated separately and simultaneously to identify cases of comorbid symptomatology. Pearson's correlation test was used to analyze the association between EPDS and GAD-7 scores. Lastly, association analyses were performed between the sociodemographic and clinical variables of the sample and the presence of clinically significant depression and anxiety symptoms.

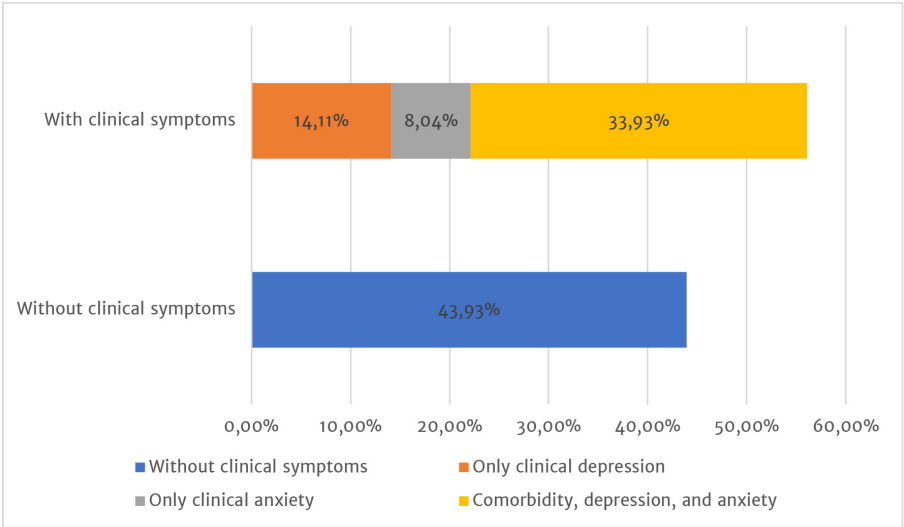
Results

The total EPDS score ranged between 0 and 29 points, with a mean score of 12.37 (SD = 5.95), while the mean of the total GAD-7 score was 9.15 (SD = 5.83), ranging between 0 and 21 points. Both scales showed good reliability indices (EPDS: α = .88; GAD-7: α = .92).

Overall, the results showed that 47.4% (n = 269) of sample participants reported potential clinical levels of postpartum depression (EPDS ≥ 13), while 261 women (41.8%) recorded a GAD-7 score ≥10, thus indicating the presence of moderate to severe levels of generalized anxiety symptoms. Figure 1 presents more detailed information regarding the profile of psychological symptoms observed in the present study sample. The results show that 275 participants (44%) did not report clinical levels of depression or anxiety, and the remaining 350 participants (56%) had clinical levels of at least one of the types of symptoms analyzed. More specifically, 89 women (14.24%) recorded clinical levels of depression only (without anxiety), 54 women (8.64%) only had clinical levels of anxiety (without depression), while 207 women (33.1%) had clinically significant comorbid anxiety and depression symptoms.

Figure 1

Depression, anxiety, and comorbidity symptoms in postpartum women during the COVID-19 pandemic in Brazil



Pearson's correlation analysis revealed a statistically significant positive correlation (of great magnitude) between the total EPDS and GAD-7 scores, r = .75, p < .001, indicating that higher levels of postpartum depression symptoms are associated with more generalized anxiety symptoms reported by postpartum women. Finally, associations (point-biserial or chi-square correlation) between the participants' sociodemographic and clinical variables and clinically significant depression and anxiety symptoms were analyzed (see Table 2). The results showed a significant association between younger maternal age and potential clinical depression (rpb = - .13, p = .002) and anxiety (r_{pb} = - .13, p = .001) levels. In addition, older infants were associated with potentially clinical depression (rpb = .11, p = .012) and anxiety (r_{pb} = .18, p < .001) levels. The mothers' residency status, ethnicity, marital status, and primiparity did not reveal any statistically significant association with reported symptomatology during the pandemic, while having less than a college degree was associated with having potential clinical depression (χ^2 = 24.78, p < .001) and anxiety (χ^2 = 27.27, p < .001) symptoms.

Table 2

Association between the sociodemographic and clinical variables of the sample and depression and anxiety symptoms

	Depression symptoms (EPDS ≥13)[e]	Anxiety symptoms (GAD-7 ≥10)[e]
Infant's age (days)[a]	.11*	.18**
Mother's age (years)[a]	- .13**	- .13**
State of residence[b]	1.10	1.12
São Paulo, n (%)	156 (25.4%)	136 (22.2%)
Other states, n (%)	136 (22.2%)	120 (19.6%)
Ethnicity[b]	.34	.003
Black/ Brown, n (%)	59 (9.6%)	54 (8.8%)
Caucasian/ Asian, n (%)	233 (38%)	202 (33%)
Educational level[b]	24.78***	27.27***
Complete higher education/ post-graduation, n (%)	180 (29.4%)	154 (25.2%)
Complete high school/ Incomplete higher education, n (%)	111 (18.1%)	102 (16.7%)
Marital status[b]	.74	2.12
In a stable relationshipc, n (%)	279 (45.6%)	243 (39.7%)
Not in a stable relationshipd, n (%)	13 (2.1%)	13 (2.1%)
Primiparous[b]	.01	.04
Yes, n (%)	166 (26.6%)	147 (23.5%)
No, n (%)	130 (20.8%)	114 (18.2%)

*$p < .05$; **$p < .01$; ***$p < .001$.

Notes: [a] Point-Biserial Correlation; [b] Chi-Square Test; [c] Married/ stable relationship/ dating/ engaged/ living with a partner; [d] Single/widowed/divorced or separated; [e] Dichotomous variable: 0 = absence of clinically significant symptoms, 1 = presence of clinically significant symptoms.

Discussion

This study aimed to assess the psychological impact of the COVID-19 pandemic, in terms of depression and anxiety symptoms, in postpartum women living in Brazil (up to 6 months after childbirth). The results confirmed the study's hypothesis, showing that approximately half of the postpartum women in the sample experienced clinically significant levels of depressive symptomatology (47.4%) and moderate to severe levels of generalized anxiety symptomatology (41.8%). In addition, there was a high comorbidity of depression and anxiety symptoms present in about a third of the participants.

Analyzing the data from studies conducted in Brazil before the pandemic, there is an increase in women with clinically significant levels of postpartum depression. For example, compared with the prevalence of depression reported in the national study by Theme Filha et al. (2016), we observed a 22% increase. However, it is essential to mention that Theme Filha et al. (2016) investigation estimated the prevalence of postpartum depression in women between 6

and 18 months after childbirth. Compared with other Brazilian studies with postpartum women up to 6 months after birth, the difference between the prevalence of PPD recorded in these studies, and our sample remains evident. In the study by Ruschi et al. (2007), the percentage of women with clinical postpartum depression symptoms was 39.4%, while in the two studies conducted in the state of São Paulo, where most of our participants live, it was 28% (Fonseca et al., 2010) and 29.5% (de Campos & Rodrigues, 2015). Thus, we conclude that the prevalence reported in the present study is higher than the prevalence presented in other studies conducted in Brazil before the COVID-19 pandemic. Still, it is also higher than the global prevalence of 22% reported in the meta-analysis by Yan et al. (2020), with studies conducted during the pandemic. In this regard, the variability in the prevalence of postpartum depression between different countries may be related to the specific epidemiological situation of each region and the period in which the study was conducted. Compared with the study by Loret de Mola et al. (2021), which was also carried out during the pandemic, with mothers of a cohort of babies born in 2019 in the state of Rio Grande do Sul, we observed that the proportion of clinically significant symptoms was higher in our study, which may be related to more prolonged exposure to the effects of the pandemic, considering the different periods in which the studies were carried out.

Regarding anxiety symptomatology, our results again demonstrate a significant increase compared to data from studies conducted before the COVID-19 pandemic. In our sample, the number of participants with moderate to high levels of anxiety symptoms practically doubled when compared to the survey by Lamus et al. (2020), with a prevalence of 19.8%, and four times higher than the results found by Loret de Mola et al. (2021). When compared to studies conducted during the pandemic, the prevalence of anxiety in postpartum women in our sample continues to be higher than the prevalence found in the study by Ceulemans et al. (2020) in Belgium (14%) and Loret de Mola et al. (2021) in Brazil (25.9%). Although the meta-analysis by Yan et al. (2020) did not report the prevalence of anxiety in postpartum women due to minimal evidence in this specific group, the authors found an overall prevalence of 37% in pregnant women during the pandemic, which is also lower than the percentage of 42% found in our sample. As for the presence of comorbid symptoms, that is, potentially clinical levels of depression and anxiety, these were identified in approximately a third of our sample, once again being higher than the prevalence reported both in studies prior (Farr et al., 2014) and during the pandemic (Sun et al., 2020). It should be noted that Sun et al. (2020) found comorbidity of depression and anxiety in 18% of the sample of pregnant and postpartum women in the studies included in the meta-analysis and which were conducted during the pandemic.

In addition to fears about the infection and its possible effects on the health of women and infants, numerous changes were imposed in perinatal health services in different countries, such as, for example, cancellation or postponement of medical appointments, face-to-face appointments replaced by telecare, restrictions on the presence of companions in medical appointments or during childbirth, and changes to women's birth plans (Lebel et al., 2020; Onwuzurike et al., 2020). These changes in perinatal care, as well as the limitation of social

contacts due to measures implemented to contain the virus, may have generated an adverse context for the mental health of women in their puerperium during the current public health crisis, negatively affecting their thoughts, emotions, and expectations of motherhood during this pandemic period. On the other hand, a recent study suggests high mortality rates among pregnant and postpartum women hospitalized with COVID-19 in Brazil (Gurzenda & Castro, 2021), which may have also contributed to the increase in psychological symptoms in this population. Although not in the scope of this study, the importance of characterizing the perinatal experiences of women during the pandemic (e.g., changes in pre and postnatal health care) is highlighted, as well as seeking to identify possible risk factors for a more negative impact on mental health (e.g., sociodemographic factors, mental health history), whether pre-existing or related to the current pandemic context.

The present study also showed that the reported symptoms were associated with younger age and lower educational levels of the participants and older infants. Younger age has been reported, albeit inconsistently, as a risk factor for perinatal mental health problems, including postpartum depression (Fisher et al., 2012; Norhayati et al., 2015). In Brazil, Theme Filha et al. (2016) study did not find any association between maternal age and clinical postpartum depression symptoms. The effect seen in the present paper was also observed in the study by Bottino et al. (2012). The authors suggest that the younger age of mothers is often associated with an unplanned pregnancy, more limited socioeconomic resources, and more unstable relationships, which may explain a greater vulnerability to developing depression symptoms. In turn, a high educational level is typically identified as a protective factor (Fisher et al., 2012; Norhayati et al., 2015), and this sociodemographic characteristic can contribute to a more favorable employment situation, access to better reproductive health care and general health care, and more resources to deal with stress and emotional difficulties. In the study by Ruschi et al. (2007), a lower educational level of mothers was also associated with a higher prevalence of clinically significant depression symptoms.

Finally, older infants will consequently represent more challenges arising from their development; for example, the infant spends more time awake and requires more attention and availability from their caregivers. This can increase the demands typically associated with motherhood, which can be more challenging to manage in highly stressful periods such as the COVID-19 pandemic, thus creating more difficulties in terms of mental health. These variables should be further investigated in future studies to characterize the sociodemographic, clinical, and relational profile that makes women in the perinatal period more susceptible to mental health problems, especially in the presence of significant stressors such as the current pandemic of COVID-19.

Overall, our results support the evidence found in international studies, also registering the significant impact of the COVID-19 pandemic on perinatal mental health compared to levels seen in the pre-pandemic phase. These data are particularly alarming if our sample mainly comprises Caucasian, married women with a higher educational level, characteristics considered

protective factors regarding postpartum mental health (Ruschi et al., 2007, Theme Filha et al., 2016). Thus, it is essential to implement measures to identify women at risk for mental health disorders during the perinatal period and define effective evidence-based intervention programs. Currently, some instruments have already been validated in the Brazilian context, being easy to apply, allowing this first screening to be conducted, and which can be implemented on a large scale (e.g., EPDS, GAD-7). However, creating public policies explicitly aimed at this population is necessary. Ensuring adequate health services (including mental health) for pregnant or postpartum women experiencing emotional distress is essential. The earlier the risk of postpartum depression and anxiety is detected, the earlier intervention is possible.

As far as we know, this is the first study in Brazil to investigate postpartum women's mental health during the COVID-19 pandemic. The online collection method also allowed the participation of many women distributed across different regions of the country. However, some limitations compromise the potential for generalizing the results, such as the fact that most participants reside in the state of São Paulo. In addition, the online questionnaires made it impossible for women without internet access or social networks to participate in this study. Likewise, difficulties in understanding the Portuguese language may also have limited the participation of women already in a particularly vulnerable situation (e.g., immigrants residing in Brazil or women with a lower educational level). Another limitation is that the demographic composition of the respondents does not adequately represent the heterogeneity of the Brazilian population since our sample mainly consisted of Caucasian women with higher educational levels. Thus, future studies should seek more excellent sociodemographic representation in assessing the impact of the COVID-19 pandemic on perinatal mental health.

Our findings point to a significant worsening of mental health indicators – anxiety and depression – of postpartum women during the COVID-19 pandemic in Brazil, so it is essential to provide immediate and adequate support to this population during the current public health crisis, to minimize possible consequences for both mothers and their infants. The results of the present study may also guide public policies and assist in planning future prevention and intervention programs aimed at women in the perinatal period. In addition, further studies must examine the long-term psychological impact of the pandemic on these women and the effects on the development of their infants.

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